

of course, the species described by Mr. G. Browne Goode in 1874 as *Dipterus Lefroyii* did not escape my notice, but that I considered and still consider the fish sent by Mr. Matthew Jones to the British Museum to be distinct, as it differs in the number and proportions of the anal spines from Mr. Browne Goode's fish. The character mentioned is one of considerable weight in the determination of the fishes belonging to the genus *Gerres*; and therefore I am not yet inclined to unite the two species, as Mr. Browne Goode appears to have done, if he was really in possession of two- as well as three-spined specimens.

With regard to *Belone Jonesii* I admit that I was not acquainted with Mr. Browne Goode's description published in 1877; and it is a very fortunate circumstance that we both happened to choose the same name.

I may mention, in palliation of this my oversight, that the report on fishes for that year in 'The Record of Zoological Literature' was not published at the time of the publication of my description, and that I am only one of the numerous victims who suffer from the tardiness of publication into which that work has been allowed to fall.

On the Presence of a Segmental Organ in the Endoproct Bryozoa.

By M. L. JOLIET.

In October 1877 Hatschek indicated in *Pedicellina echinata*, both in the larval and adult state, a vibratile canal, of which, however, he seems not to have well made out the form, and which he compares to the vibratile organs of the Rotatoria. I am in a position to confirm the statements of the zoologist of Prague, at the same time correcting and completing them, and to extend them to the whole group of Endoproct Bryozoa.

In a spineless variety of *Pedicellina echinata* which abounds at Roscoff, whence the keeper of the laboratory sent it to me alive within the last few days, the vibratile organ is double, and situated in the cavity of the body, in the space included between the œsophagus, the stomach, and the matrix.

It consists of a short tube, ciliated internally, inflated at its middle, which, on the one hand, opens into the matrix, not far from its external aperture, and, on the other, opens obliquely into the cavity of the body by a slightly funnel-shaped passage furnished with active vibratile cilia. This organ, furnished with a vibratile pavilion, and placing the cavity of the body in communication with the outer world, has all the characters of a segmental organ. It appears very early in the bud. When the stomach is only sketched out, and before the arms are indicated, we already see a ciliary movement at the place that it will occupy.

In a still undescribed species of *Pedicellina* from the island of St. Paul, I have recently detected the same vibratile organ. Lastly, in the *Loxosoma* of *Phascolosoma*, I last summer, at Roscoff, recog-

nized a perfectly similar canal, terminated by a pavilion and placed in the same situation. As in *Pedicellina*, it appears very early in the bud.

In the group Endoprocta, including the highest forms of the Bryozoa, we may therefore regard as constant the presence of a segmental organ—that is to say, an organ which is very generally diffused among the Vermes.

Considering the endeavours that have been made of late years to approximate the Bryozoa to the Annulata, I have thought it an advantage to bring this new argument into the debate, as it seems to me to possess a real value.—*Comptes Rendus*, February 24, 1879, p. 392.

The Origin of the specialized Teeth of the Carnivora.

By E. D. COPE.

The specially developed teeth of the Carnivora are the canines and sectorials. The former are large in many orders of Mammalia; and their origin is probably to be sought among the Theromorphous Reptilia*, such as *Clepsydraps* and *Deuterosaurus*, if not in still lower types. The successive modifications of form which have resulted in the existing specialized single sectorial tooth of the Felidæ have been already pointed out †. They were shown to consist in the gradual obliteration of the internal and posterior tubercles and the enlargement of the external anterior tubercle in connexion with an additional anterior tubercle. The modification in the character of the dentition, taken as a whole, was shown to consist in the reduction in the number of teeth, including the sectorials, until in *Felis* &c. we have almost the entire function of the molar series confined to a single large sectorial in each jaw.

Observation on the movements of the jaws of Carnivora shows that they produce a shearing motion of the inferior on the superior teeth. This is quite distinct from the subhorizontal movement of Ruminants, or the vertical motion of hogs and monkeys. Examination of the crowns of the sectorials shows that the inner side of the superior and the external side of the inferior are worn in the process of mastication. The attempt to cut the tough and stringy substances found in animal bodies is best accomplished by the shearing of the outer edge of the lower molar on the inner edge of the external tubercles of the superior molar in an animal with simple tubercular teeth. The width of the mandible is too great to allow the inferior teeth to shear on the inner edge of the inner tubercles of the superior series. The cusps of both superior and inferior teeth engaged in this process have developed in elevation at the expense of those not engaged in it, viz. the internal cusps of the same teeth. The atrophy of the latter cannot have been due to friction, since the internal cusps of the inferior series, which have

* 'American Naturalist,' 1878, p. 829.

† Cope, 'Proceedings Academy Philad.' 1865, p. 22.